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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/577,013

07/13/2006

Jost Eberach

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EXAMINER

PATEL, DEVANG R

ART UNIT

PAPER NUMBER

1793

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/577,013	EBERACH, JOST	
	Examiner	Art Unit	
	DEVANG PATEL	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/20/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims 1-3** are rejected under 35 U.S.C. 103(a) as obvious over Wagenbach et al. (DE 4429684 A1, see written translation) in view of Deutsch et al. (US 3410983).

a. **Regarding claim 1**, Wagenbach et al. (hereafter Wagenbach) discloses a method for welding electric conductors using ultrasound (abstract). The electric conductors include litz wires since Wagenbach discloses braid joints and producing end nodes of strands [pg. 1]. Wagenbach discloses that the conductors are introduced into a compression chamber 10 [fig. 1] that is bounded by at least two boundary elements - 12, 14, 16, 18, and are welded after the compression chamber is closed, whereby ultrasound is applied via a first element such as a sonotrode 20 [fig. 1; pgs. 9-10]. The conductors are acted upon by

pressure via the first element or a second element, such as a counter electrode 22, and whereby a characteristic magnitude (height/width) of the compression chamber is measured [pg. 11]. Wagenbach discloses a control unit 46 that monitors and adjusts allocated welding parameters, including welding pressure, that are continuously adapted for ensuring uniform weld quality [pgs. 5,16].

Wagenbach discloses opening the compression chamber 10 by opening the tool (i.e. decompressing the chamber) and measuring the characteristic magnitude with or after the end of the welding operation [pgs. 17-18].

b. Wagenbach fails to explicitly disclose applying ultrasound to the welded conductors. However, **Deutsch et al.** (drawn to a method of resistance welding and testing) discloses applying a series of first pulses of ultrasonic energy to the workpieces prior to welding and also applying a series of second ultrasonic pulses after welding [col. 3, lines 40-46]. Deutsch teaches that in this way, a quantitative determination of the variations in the level of the received ultrasonic energy is effective for determining the quality of the weld as well as the type of defect [col. 3, lines 58-67]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to apply ultrasound on the welded parts as taught by Deutsch in the method of Wagenbach because such ultrasonic treatment allows effective determination of the quality of the weld and the type of defect [col. 3, lines 58-67].

c. **As to claim 2**, Wagenbach discloses that the compression chamber 10 is bounded by at least three elements (12, 14, 16) and after the welding, at least

one previously fixed element in relation to the welded conductor is opened (i.e. unlatched; pg. 18).

d. **As to claim 3**, Wagenbach discloses that a geometric value such as height or width is selected as a characteristic magnitude [pg. 6].

5. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagenbach (DE 4429684) in view of Deutsch et al. (US 3410983) as applied to claim 1 above, and further in view of Steiner et al. (US 5941443).

e. **Regarding claim 4**, Wagenbach does not disclose measuring the geometric value by a displacement pickup. However, Steiner et al. (drawn to compaction and ultrasonic welding of electric conductors) discloses measuring compaction area (height & width) by a travel pickup [col. 2, lines 25-40]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the travel pickup device of Steiner in the method of Wagenbach to measure the geometric variables in order to apply proper welding parameters such as welding energy, amplitude, time, etc. during welding of the conductors [col. 2, lines 40-45].

6. **Claims 5-8 and 10-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagenbach et al. (DE 4429684) in view of Deutsch et al. (US 3410983) and further in view of Eder et al. (US 6393924).

f. **Regarding claim 5**, Wagenbach discloses a method for quality checking of welded electric conductors using ultrasound [abstract].. The electric conductors include litz wires since Wagenbach discloses braid joints and

producing end nodes of strands [pg. 1]. Wagenbach discloses a compression chamber bounded at least by an ultrasound-applying first element such as a sonotrode (20) and a second element such as a counter electrode (22), whereby the conductors are acted upon by pressure via the second or first element, characterized by:

- i. introducing the welded conductors into a compression chamber;
- ii. compacting and welding the conductors with simultaneous cross section diminution of the compression chamber [pg. 12];
- iii. measurement of a characteristic magnitude of the compression chamber [pg. 11];
- iv. opening the compression space (i.e. decompressing) by opening the tool, whereby the welded conductors would remain between other two lateral elements [pg. 18];
- v. Wagenbach fails to explicitly disclose applying ultrasound with simultaneous action of pressure. As for the ultrasound, **Deutsch et al.** discloses applying a series of first pulses of ultrasonic energy to the workpieces prior to welding and also applying a series of second ultrasonic pulses after welding [col. 3, lines 40-46]. Deutsch teaches that in this way, a quantitative determination of the variations in the level of the received ultrasonic energy is effective for determining the quality of the weld as well as the type of defect [col. 3, lines 58-67]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to

apply ultrasound on the welded parts as taught by Deutsch in the method of Wagenbach because such ultrasonic treatment allows effective determination of the quality of the weld and the type of defect [col. 3, lines 58-67]. Concerning the action of applying pressure, **Eder et al.** (drawn to non-destructive testing of welded electric conductor by ultrasonic welding) discloses applying a pressure to the structure of the weld and checking the "uncoiling" of the conductor made up of strands of wires welded to each other [col. 2, lines 33-42]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to apply pressure as taught by Eder in the modified weld quality checking method of Wagenbach in order to obtain a certain indication as to the strength and electrical conductivity of the weld [col. 2, lines 20-30].

- g. **As to claim 6**, Wagenbach discloses subjecting the conductors to pressure via the second lateral element [fig. 1].
- h. **As to claim 7**, Wagenbach discloses that the quality of the welding is evaluated as a function of the measured characteristic magnitude of the compression chamber [pg. 13].
- i. **As to claim 8**, Wagenbach discloses measuring the height and/or width of the compression chamber 10 as explained in claim 1 above.
- j. **As to claim 10**, Eder discloses that the testing force to be applied depends on the cross-sections, size, and material of the wires making the strands of electrical conductor. It would have been obvious to one of ordinary skill

in the art at the time of the invention to choose the instantly claimed pressure range through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980).

k. **As to claim 11**, Eder discloses that the pressure applied destroys the weld (uncoiling of the wires) for a faulty weld [col. 2, lines 35-42].

l. **As to claim 12**, it would have been obvious to a person of ordinary skill in the art to apply ultrasound again for selective recompression of the weld in the method of Wagenbach because such treatment is favorable for a strongly compacted weld [pg. 2].

m. **As to claim 13**, Wagenbach discloses the welded conductors arranged between a sonotrode and a counter electrode. Combination of Wagenbach, Deutsch and Eder as a whole makes it obvious to an artisan of ordinary skill to apply an ultrasound along with simultaneous pressure in a weld quality checking method for the reasons set forth in paragraph f above. Wagenbach implicitly discloses measuring the changes in spacing between the sonotrode and counter electrode by measuring the compression area enclosed by the lateral surfaces of those elements.

7. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagenbach (DE 4429684) in view of Deutsch et al. (US 3410983) and Eder et al. (US 6393924) as applied to claim 5 above, and further in view of Peter (US 4746051).

n. **Regarding claim 9**, none of the references applied to claim 5 above discloses the duration of applying ultrasound. Peter is drawn to ultrasonic welding control method and apparatus to produced completed welds of acceptable quality [abstract]. By way of example, Peter discloses time duration of 0.2 seconds- 200 ms and further states that the magnitudes of the energy and time settings are determined from actual welding of the workpieces [conductors in this case] and then selecting magnitudes that produces acceptable welds. It would have been obvious to one of ordinary skill in the art at the time of the invention of ultrasonic welding to incorporate the control method of Peter in the process of Wagenbach and accordingly, choose the instantly claimed ultrasound duration range of 10-250 ms through routine experimentation in order to produce acceptable welds [col. 8, lines 50-61].

Information Disclosure Statement

8. The information disclosure statement (IDS) submitted on 7/20/06 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Conclusion

Claims 1-13 are rejected.

The rejections above rely on the references for all the teachings expressed in the text of the references and/or one of ordinary skill in the art would have reasonably understood from the texts. Only specific portions of the texts have been pointed out to emphasize certain aspects of the prior art, however, each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

Art Unit: 1793

Applicant is reminded to specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. 1.121; 37 C.F.R. Part 41.37; and MPEP 714.02.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVANG PATEL whose telephone number is (571)270-3636. The examiner can normally be reached on Monday thru Thursday, 8:00 am to 5:30 pm, EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DP/

/Jessica L. Ward/

Supervisory Patent Examiner, Art Unit 1793